

PATENT ABSTRACTS OF JAPAN

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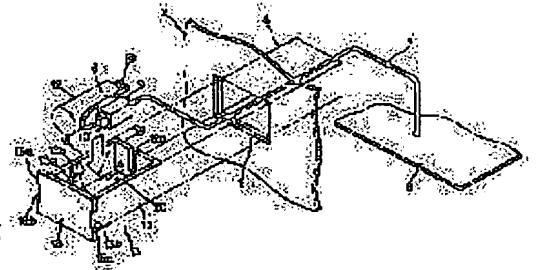
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(54) BATTERY STORAGE STRUCTURE**(57)Abstract:**

PROBLEM TO BE SOLVED: To prevent the reduction of the packaging area of a printed wiring board, prevent short-circuiting of the circuit of the printed wiring board by a liquid leakage, and facilitate the replacement of a battery by storing and holding the battery in a battery storage case, storing the battery storage case in a storage section, and guiding a lead wire through the slit of the battery storage case.

SOLUTION: One end of a lead wire 13 is connected to the positive and negative electrodes of a battery 12, the other end is connected to a plug 10 constituting a connector 8, and the positive and negative electrodes of the battery 12 are connected to the circuit of a printed wiring board 6 via lead wires 13, 7 when the plug 10 is coupled with a socket 9. A rectangular window 3 is bored on the surface of an apparatus casing 2, and a storage section 4 is formed from the peripheral end edge of the window 3 toward the inside of the apparatus casing 2. The battery 12 and connector 8 are held in the battery storage case 15, the lead wire 7 is guided through the slit 19a of a back plate 19, and the battery storage case 15 is inserted into the storage section 4 from the window 3 and stored in it.

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CLAIMS

[Claim(s)]

[Claim 1] The cell receipt structure which is the cell receipt structure which contains the cell connected to the circuit of a printed wired board prepared in the device housing in a device housing, and carries out the description of having prepared the attaching part holding said cell and connector in the device housing so that the part might appear in the front face of a device housing while connecting with the lead wire which drew the lead wire linked to each of the positive electrode and the negative electrode of a cell from the circuit of a printed wired board through the connector.

[Claim 2] Cell receipt structure characterized by preparing the lead-wire derivation section which constitutes the cell receipt case which contains a cell and a connector for an attaching part, and this cell receipt case in cell receipt structure according to claim 1 from the storing section stored free [insert and remove] from a device housing front face, and derives lead wire in a device housing in these cell receipt case and the storing section.

[Claim 3] Cell receipt structure characterized by considering as the cell lid equipped with the attaching part which closing motion on a device housing front face is free in an attaching part, and holds a cell and a connector in cell receipt structure according to claim 1.

[Claim 4] The cell receipt structure characterized by to prepare the lead-wire derivation section which is supported by the cell lid free [attachment and detachment] in an attaching part so that [opening] it may be blockaded by the cell lid which can be freely opened and closed on a device housing front face, and this cell lid, constitutes a cell and a connector from a cell receipt case which carries out receipt maintenance in cell receipt structure according to claim 1, and derives lead wire in a device housing in a cell receipt case.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the receipt structure of the cell connected to the circuit prepared in various kinds of electronic equipment housings.

[0002]

[Description of the Prior Art] Generally, the cell receipt case 52 the upper part carried out [the case] opening is carried on the printed wired board 51 prepared in the device housing with which this kind of cell receipt structure omitted illustration as shown in drawing 10 R> 0. The contact segments 53 and 53 (not shown [one contact segment 53]) of the pair formed of electric conduction material are formed in the medial surface of the both-sides plate with which this cell receipt case 52 counters, and these terminals 53 and 53 are connected to the circuit of a printed wired board 51. The cell 50 contained in this cell receipt case 52 is connected to the circuit of a printed wired board 51 when forward [of this cell 50] and the negative polar zone 50a and 50b (polar-zone 50b is not shown) contact contact segments 53 and 53.

[0003]

[Problem(s) to be Solved by the Invention] However, in the conventional cell receipt structure mentioned above, since it had the structure where the cell receipt case 52 was carried on the printed wired board 51, while the component-side product of a printed wired board 51 decreased, when liquid leaked from a cell, there was a possibility of making the circuit formed in the printed wired board 51 short-circuiting. Moreover, when the printed wired board 51 was arranged among device housings at the way, the hand was inserted to the way among devices and there were also ***** and a problem that exchange of a cell 50 became complicated for this reason.

[0004] The place which this invention is made in view of the above-mentioned conventional problem, and is made into the purpose is to prevent short-circuit of the circuit of the printed wired board by liquid leaking, and offer cell receipt structure with easy exchange of a cell while not decreasing the component-side product of a printed wired board.

[0005]

[Means for Solving the Problem] In order to attain this purpose, the cell receipt structure concerning this invention It is the cell receipt structure which contains the cell connected to the circuit of a printed wired board prepared in the device housing in a device housing. While connecting with the lead wire which drew the lead wire linked to each of the positive electrode and negative electrode of a cell from the circuit of a printed wired board through the connector, the attaching part holding said cell and connector is prepared in a device housing so that the part may appear in the front face of a device housing. Therefore, a cell is not carried on a printed wired board. Moreover, exchange of a cell is performed in the front face of a device housing.

[0006]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained based on drawing. The perspective view decomposing and showing the cell receipt structure which drawing 1 requires for this invention, the perspective view showing the connection condition to which drawing 2 similarly connected the cell and the connector through lead wire, and drawing 3 (a) can be set in a top view, and, similarly (b) can be set to (a). It is an III(b)-III(b) line sectional view. In these drawings, it is the housing of the electronic equipment which omitted illustration, as for 2, the rectangle-like aperture 3 is drilled in that front face, and the storing section 4 of the shape of a closed-end rectangular pipe set up in one toward the way among the device

housings 2 from the peripheral edge edge of this aperture 3 is formed. 6 is the printed wired board prepared in the device housing 2, and said aperture 3 is formed in the location estranged from this printed wired board 6. The lead wire 7 connected and drawn by the circuit of a printed wired board 6 is introduced in the storing section 4 from the insertion hole (illustration is omitted) formed in the tooth-back section of said storing section 4, and the tip is connected to the socket 9 formed in the shape of [which constitutes a connector 8] an abbreviation rectangle.

[0007] 12 is a cell, the end of lead wire 13 is connected to forward [of this cell 12], and each of a negative electrode, the other end is connected to the plug 10 formed in the shape of [which constitutes a connector 8] an abbreviation rectangle, and forward [of a cell 12] and a negative electrode are connected to the circuit of a printed wired board 6 through lead wire 13 and 7 by fitting a plug 10 into a socket 9.

[0008] 15 is a cell receipt case and the cross section the upper part carries out [the cross section] opening with the front plate 16, the side-face plates 17 and 18 of the pair which counters, the tooth-back plate 19, and the bottom face-plate 20 is formed in the shape of an abbreviation KO character. This cell receipt case 15 is slightly formed small rather than the form dimension among the storing sections 4 of the device housing 2 which the dimension formed by the both-sides face-plates 17 and 18 and the bottom face-plate 20 mentioned above. The both-sides edge of the front plate 16 projects slightly from the both-sides face-plates 17 and 18, flange 16a is formed, and crevice 16b is formed in the center of the edge of these flange 16a.

[0009] Claw part 17a protrudes toward a way among the cell receipt cases 15, a cross section is formed in the central upper part of the longitudinal direction of the medial surface of one side-face plate 17 in the shape of radii, and, as for the center of abbreviation of the longitudinal direction of the medial surface of the side-face plate 18 of another side, projection 18a protrudes on it toward the way at the upper limit among the cell receipt cases 15. Slit 19a the upper part carried out [a] opening to the tooth-back plate 19 is formed, and crevice 20a is formed in the bottom face-plate 20.

[0010] In such a configuration, if a cell 12 and a connector 8 are inserted from opening of the cell receipt case 15 and a cell 12 is laid in crevice 20a of the bottom face-plate 20, while a part of top face of a cell 12 will engage with projection 18b, this connector 8 and said cell 12 are held in the cell receipt case 15. At this time, the lead wire 7 connected to the socket 9 of a connector 8 is drawn from slit 19a of the tooth-back plate 19. The cell receipt case 15 is stored in the storing section 4 by inserting the cell receipt case 15 in this condition, until flange 16a contacts the edge of an aperture 3 in the storing section 4 from the aperture 3 of the device housing 2. In pulling out the cell receipt case 15 stored in the storing section 4 from the storing section 4, it carries out by inserting a driver etc. into crevice 16b of the front plate 16.

[0011] Thus, a cell 12 is not carried on a printed wired board 6 by having made the cell 12 contain and hold in the cell receipt case 15, and having made it estrange from a printed wired board 6. Therefore, even if the component-side product of a printed wired board 6 does not decrease and the liquid spill of a cell occurs, a printed wired board 6 is not affected. Moreover, since the cell receipt case 15 which carries out receipt maintenance of the cell 12 can take out the cell receipt case 15 from the storing section 4 easily by being stored in the storing section 4 which has an aperture 3 on the front face of a device 2, it can check the connection condition of a connector 8 easily, and, for this reason, can prevent a faulty connection. Moreover, since lead wire 7 is drawn from slit 19a of the cell receipt case 15, by grasping this lead wire 7 with a finger, a cell 12 can be easily taken out together with a connector 9, and, for this reason, exchange of a cell 12 becomes easy.

[0012] Moreover, since a cell 12 and a connector 8 are certainly held in the cell receipt case 15 and it is drawn from slit 19a by preparing claw part 17a and projection 18b in the cell receipt case 15, lead wire 7 and 13 is also certainly held in the cell receipt case 15. For this reason, since it seems that slack does not occur in lead wire 7 and 13 within the cell receipt case 15 in case the insert and remove of the cell receipt case 15 are carried out from the storing section 4, lead wire 7 and 13 is pinched between the cell receipt case 15 and the device housing 2, or it can prevent carrying out and an open circuit is prevented. Moreover, by having made it make in agreement the longitudinal direction of the cell 12 contained in the cell receipt case 15, and the storing direction to the storing section 4 of the cell receipt case 15, the dimension of an aperture 3 can be made small, and when an aperture 3 cannot be greatly opened in the device housing 2 for this reason, it becomes effective.

[0013] Drawing 4 is the perspective view showing the gestalt of operation of the 2nd of this invention. A different point as compared with the gestalt of the 1st operation mentioned above has the gestalt of this 2nd operation in the receipt direction of the cell 12 contained in the cell receipt case 15. That is, the longitudinal

direction of the cell 12 contained in the cell receipt case 15 is made to intersect perpendicularly to the storing direction to the storing section 4 of the cell receipt case 15. Therefore, that what is necessary is to make the dimension of the depth of the storing section 4 correspond to the path of a cell 12, and just to form it, since the dimension of the depth of the storing section 4 can be made small for this reason, when the dimension of the depth of the device housing 2 is small, it becomes effective.

[0014] Drawing 5 and drawing 6 are VI(a)-VI [in / the gestalt of operation of the 3rd of this invention is shown, and / drawing 5 and / in drawing 6 (a) / drawing 5] (a). (b) is a line sectional view and VI(b)-VI (b) in drawing 5 . It is a line sectional view. [a perspective view] The gestalt of this 3rd operation forms the cell lid 25 which formed the aperture 3 for cell receipt in the top-face plate of the device housing 2, and was formed in the abbreviation plate-like which opens and closes this aperture 3. By making the engagement member 26 of the shape of a cross section of L characters formed in this cell lid 25 at one engage with the end edge of an aperture 3, the engagement member 26 is set as a rotation core, and is supported for the cell lid 25, enabling free rotation.

[0015] Crevice 25a is formed in the center section of the engagement member 26 of the cell lid 25, and the edge of the opposite side, and the pieces 27 and 27 of elastic engagement by which the claw part was formed at the tip are set up by the both ends of this edge. The piece 28 of pinching is set up by the rear face of the cell lid 25 so that it may counter with the engagement member 26, and spacing of this piece 28 of pinching and the engagement member 26 is slightly formed in it greatly rather than the overall length of a cell 12. moreover -- the rear face of the cell lid 25 -- a cell 12 and abbreviation -- while the pair set-up of the 1st piece 29 and 29 of maintenance of the shape of radii which a part of peripheral surface cut and lacked with the same path is carried out, the piece 30 of **** which holds a cell 12 with this 1st piece 29 of maintenance protrudes.

[0016] As shown in drawing 6 (a), spacing of the tip of the 1st piece 29 of maintenance and the piece 30 of **** in side view is formed a little smaller than the path of a cell 12. Moreover, the 1st piece 29 of maintenance of a pair and spacing between 29 are slightly formed greatly rather than the overall length of a connector 8. Between the 1st piece 29 of maintenance of a pair, and 29, the 2nd piece 31 of maintenance by which the claw part was formed at the tip for the cross section with abbreviation inverse L-shaped is set up by the rear face of the cell lid 12. As shown in drawing 6 (b), the amount of protrusions from the rear face of the cell lid 12 of this 2nd piece 31 of maintenance is slightly formed for a long time from the die length which applied the height of a connector 8 to the path of a cell 12.

[0017] In such a configuration, while making a cell 12 insert in the 1st piece 29 of maintenance from the notch of the 1st piece 29 of maintenance, carrying out elastic deformation of the 1st piece 29 of maintenance, it faces across the both-ends side of a cell 12 by the piece 26 of engagement, and the piece 28 of pinching. Therefore, migration of the overall-length direction is regulated by the piece 26 of engagement, and the piece 28 of pinching, and a cell 12 is held at the rear face of the cell lid 25, when the omission from the notch of the 1st piece 29 of maintenance is prevented by the piece 30 of ****. Next, if a connector 8 is made to insert in the 2nd piece 31 of maintenance, carrying out elastic deformation of the 2nd piece 31 of maintenance, while migration of the height direction is regulated by a cell 12 and the 2nd piece 31 of maintenance, as for a connector 8, the omission from the 2nd piece 31 of maintenance will be prevented by the claw part at the tip of the 2nd piece 31 of maintenance. By inserting the both-ends side of a connector 8 into coincidence by the 1st piece 29 and 29 of maintenance of a pair, migration of the die-length direction is regulated by the 1st piece 29 and 29 of maintenance of a pair, and a connector 8 is held at the rear face of the cell lid 25.

[0018] Thus, after holding a cell 12 and a connector 8 on the cell lid 25, rotate the cell lid 25 by setting the piece 26 of engagement as a rotation core, and a claw part is made to make the piece 26 of engagement of the cell lid 25 engage with the end edge of an aperture 3, and to engage with the other end edge of an aperture 3, carrying out elastic deformation of the piece 27 of elastic engagement, and an aperture 3 is blockaded with the cell lid 25. In exchanging a cell 12, a driver etc. is inserted in crevice 25a of the cell lid 25, elastic deformation of the piece 27 of elastic engagement is carried out, and it cancels engagement on the claw part of the piece 27 of elastic engagement, and the other end edge of an aperture 3. And the cell lid 25 is removed from the device housing 2 by rotating the piece 26 of engagement for the cell lid 25 as a rotation core, opening an aperture 3 wide, and canceling engagement on the piece 26 of engagement, and the end edge of an aperture 3.

[0019] Thus, since the cell lid 25 can be removed from the device housing 2, exchange of a cell 12 becomes easy. Moreover, by having been made to perform the member holding a cell 12 and a connector 8 with the cell

lid 25 formed in plate-like that what is necessary is just to form an aperture 3 in the device housing 2, since components mark are also reduced while structure becomes simple, a manufacturing cost is reduced. By forming the cell lid 25 in plate-like, anchoring of a cell 12 and removal become easy.

[0020] Drawing 7 shows the gestalt of operation of the 4th of this invention, (a) is a sectional view and (b) is a top view. With the gestalt of this 4th operation, the thickness by the side of the rear face of the part which forms aperture 25b of the shape of a long and slender rectangle in the cell lid 25 of the gestalt of the 3rd operation mentioned above along with the longitudinal direction of the cell 12 held at the cell lid 25, and forms aperture 25b in it is formed thinly. Thus, since a cell 12 can be checked from the exterior even if it does not remove the cell lid 25 from the device housing 2 by having formed aperture 35a, a failure of a cell to put in can be prevented.

[0021] Drawing 8 is the perspective view showing the gestalt of operation of the 5th of this invention. In the gestalt of this 5th operation, through the hinge 35 attached in the cell lid 25 and the device housing 2, the cell lid 25 is constituted so that an aperture 3 may be opened and closed. Thus, loss of the cell lid 25 can be prevented by having constituted so that the cell lid 25 might not separate from the device housing 2 with a hinge 35. Moreover, the closing motion direction of the cell lid 25 by the hinge 35 can make low the height of the cell lid 25 when opening from an aperture 3 by considering as the direction which intersects perpendicularly with the longitudinal direction of the cell 12 held at the cell lid 25. For this reason, even when sufficient space for a changing battery is not obtained above an aperture 3, a changing battery can be performed easily.

[0022] Drawing 9 shows the gestalt of operation of the 6th of this invention, (a) is a cross-sectional view and (b) is drawing of longitudinal section. In the gestalt of this 6th operation, it has the cell receipt case 44 which carries out receipt maintenance of the covering 40 which blockades an aperture 3, and a cell 12 and a connector 8. While the peripheral edge of an aperture 3 is formed in the shape of a stage and the step to which the periphery edge of covering 40 also engages with this step is formed, two pairs of pieces 41 (the piece 41 of elastic engagement of a pair omits illustration) of elastic engagement equipped with the claw part which protruded on the rear face of one flank at which covering 40 counters so that it might face at a tip mutually which counter are set up. Moreover, covering 40 counters and also the pieces 42 and 42 of elastic engagement to which the pair equipped with the claw part which protruded on the opposite direction mutually at the tip counters the rear face of a flank are set up.

[0023] Among two pairs of side plates which are formed in box-like [which was set up from the peripheral edge edge of a bottom plate and a bottom plate / in which was enclosed and the upper part carried out opening with the wall], and form an enclosure wall and which counter, the cell receipt case 44 is drilled in the upper part of the side plates 45 and 45 of a pair so that the holes 45a and 45a with which the claw part of said piece 41 of elastic engagement is engaged may counter. Slit 46a for lead-wire derivation the upper part carried out [a] opening is formed in one another side plate 46 of the side plate of a pair which forms an enclosure wall.

[0024] In such a configuration, in the cell receipt case 44, a cell 12 and a connector 8 are contained and lead wire 7 is derived from slit 46a. The cell receipt case 44 is supported on the cell lid 40 by making the claw part of the piece 41 of elastic engagement of covering 40 engage with hole 45a of the cell receipt case 44, as covering 40 is put on opening of the cell receipt case 44. Next, while blockading an aperture 3 with covering 40 by inserting the cell receipt case 44 into the device housing 2 from an aperture 3, and making a claw part engage with the edge of an aperture 3, carrying out elastic deformation of the piece 42 of elastic engagement of covering 40 as shown in drawing 9 (b), the cell receipt case 44 is contained in the device housing 2.

[0025] With the gestalt of this 6th operation, since a cell 12 is covered with the cell receipt case 44 and covering 40, even when liquid leaks from a cell, for this reason, short-circuit of the circuit of a printed wired board can be prevented so that it may not leak from the cell receipt case 44. Moreover, it is not necessary to form in the device housing 2 interior the storing section which stores the cell receipt case 44, and, for this reason, processing of the device housing 2 becomes easy by having supported the cell receipt case 44 with covering 40.

[0026]

[Effect of the Invention] As explained above, while being able to prevent reduction of the component-side product of a printed wired board according to this invention, short-circuit of the circuit formed in the printed wired board by liquid leaking from a cell can be prevented. Moreover, exchange of a cell becomes easy in order not to insert a hand to a way among device housings in exchange of a cell.

[0027] Moreover, according to the 2nd invention, even if the liquid of a cell leaks, short-circuit of the circuit

which did not leak from a cell receipt case and was formed in the printed wired board for this reason can be prevented more certainly. Since a cell can be easily removed from a cell receipt case through the lead wire drawn from the lead-wire derivation section, exchange of a cell becomes easier. Moreover, since lead wire is certainly held in a cell receipt case, an open circuit of the lead wire at the time of carrying out the insert and remove of the cell receipt case from the storing section can be prevented.

[0028] Moreover, according to the 3rd invention, while structure becomes simple, components mark are also reduced and a manufacturing cost is reduced.

[0029] Moreover, even if the liquid of a cell leaks, while being able to prevent more certainly short-circuit of the circuit which did not leak from a cell receipt case and was formed in the printed wired board for this reason according to the 4th invention, processing of a device housing becomes easy.

[Translation done.]

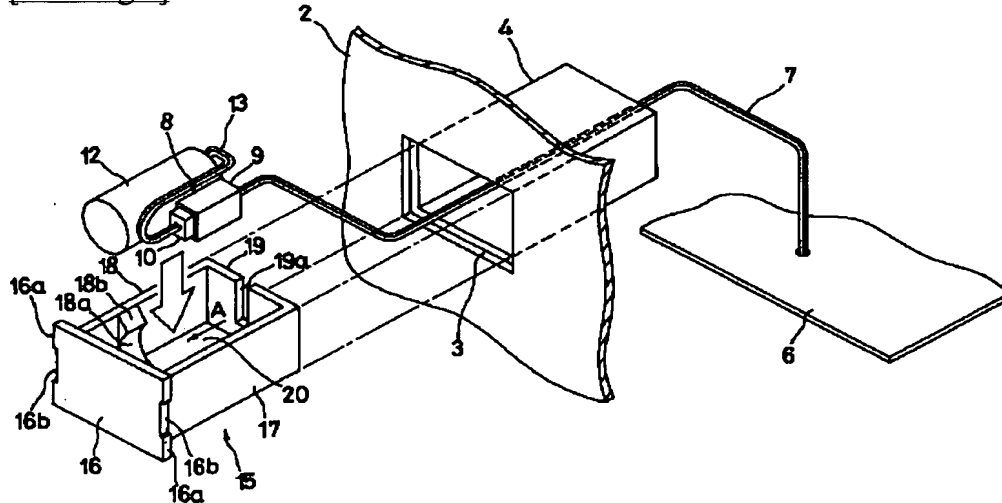
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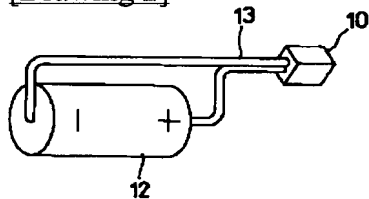
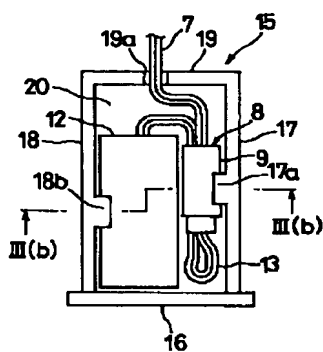
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DRAWINGS

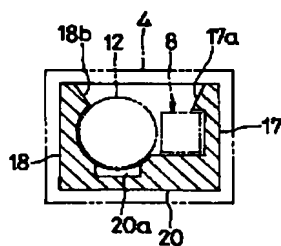
[Drawing 1]



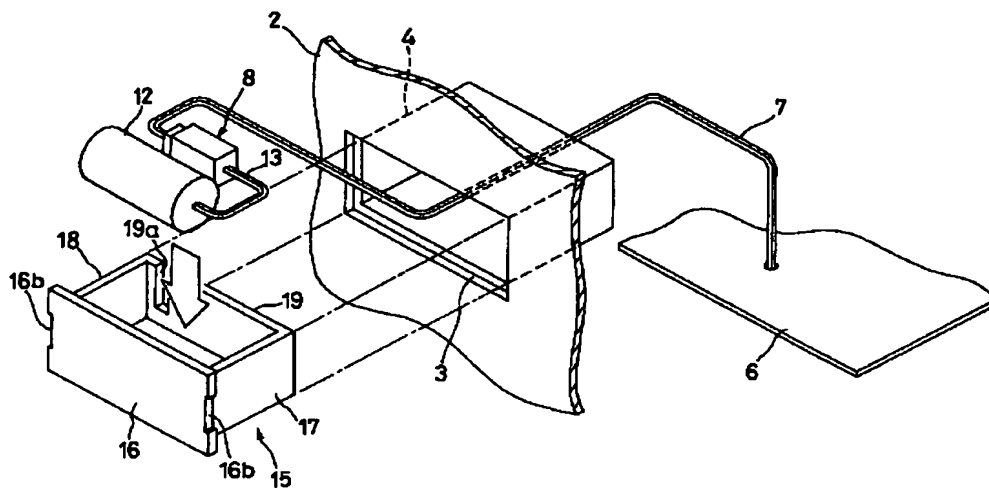
[Drawing 2]

[Drawing 3]
(a)

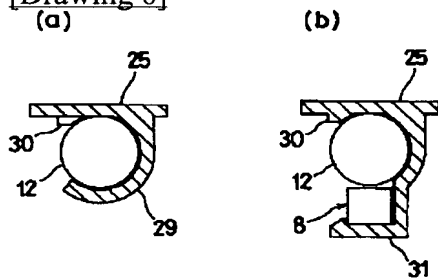
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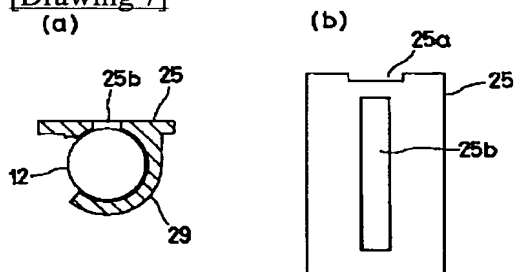
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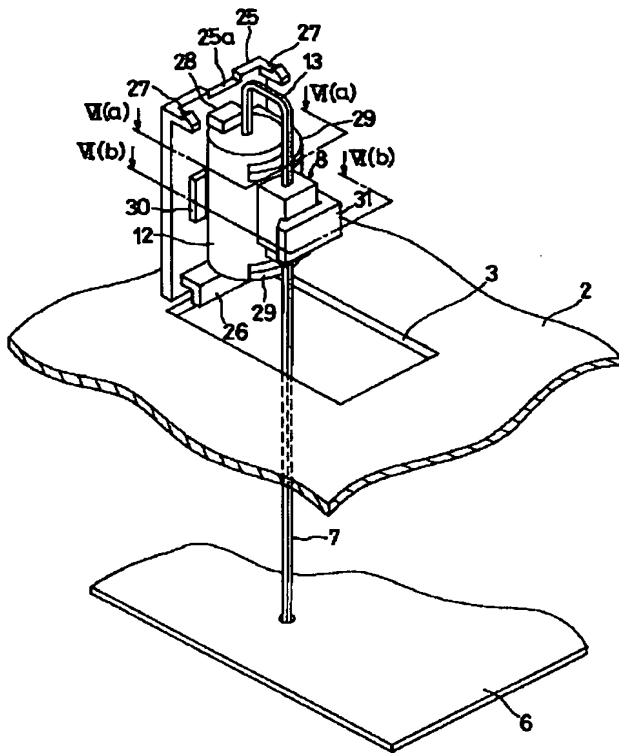
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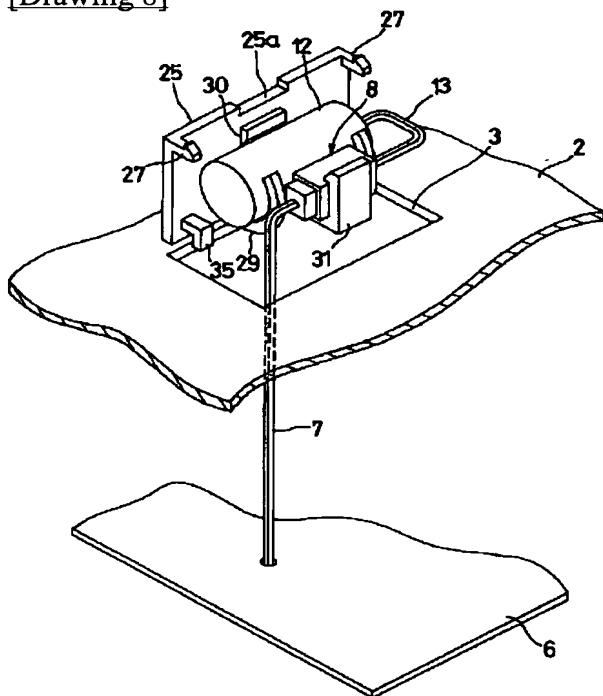
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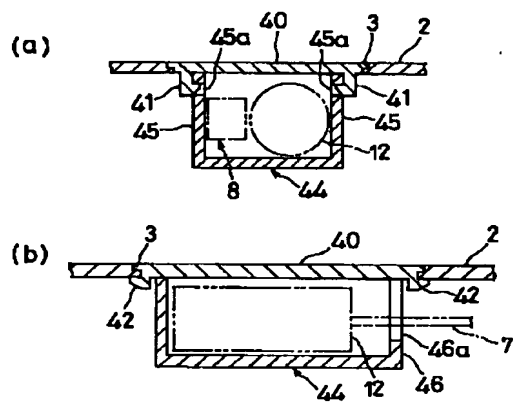
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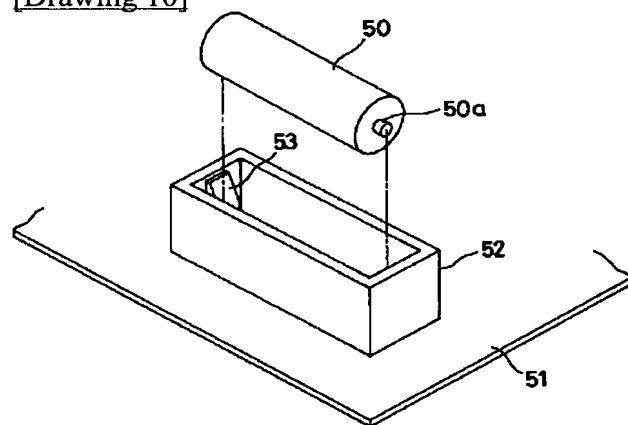
[Drawing 8]



[Drawing 9]



[Drawing 10]



[Translation done.]